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EXAMINER

MAKI, STEVEN D

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**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.



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1) The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2) **Claims 1 and 3-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art (specification page 1 lines 19-33, page 2 lines 1-12) in view of Sucech (US 5,643,510) and optionally further in view of Soviet Union (SU 1252321), Japan (JP 10-330174) or Great Britain (GB 2032413).**

The admitted prior art discloses a process for manufacturing a foamed gypsum board comprising:

blowing air into a foaming agent to form a "**preliminarily produced foam**";

obtaining a foamed gypsum slurry by mixing the "preliminarily produced foam" into a kneaded material containing calcined gypsum, adhesive, additives and water;

pouring the foamed gypsum slurry into a space between upper and lower base papers;

passing the gypsum slurry covered with base papers through a shaping machine for determining the thickness and width of a gypsum board;

roughly cutting off the shaped strip-type gypsum board;

drying the rough cut gypsum board by passing it through a force drying machine;

cutting the dried gypsum board to a predetermined dimension.

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The admitted prior art does not recite forming the preliminarily produced foam using a foaming agent and a pore size adjusting agent.

As to claim 1, it would have been obvious to one of ordinary skill in the art to obtain a **"foaming agent for producing foams of desired sizes"** ("**pregenerated foam**") by preliminarily adding a "pore size adjusting agent" to a stock solution of foaming agent so that when such a "foaming agent for producing foams of desired sizes" is used in the admitted prior art process to form "preliminary produced foam" ("**pregenerated foam**"), the manufactured gypsum board (plaster board) has pores with predetermined size distributed in a gypsum core in view of:

Sucech's suggestion to control void size (and thereby improve nail pull and strength) in a foamed gypsum board by forming a **"pregenerated foam"** from a mixture of a first stable foaming agent such as alkyl ether sulfate *and* a second unstable foaming agent such as alkyl sulfate *before* adding the foam to the gypsum slurry to form a foamed gypsum slurry to be placed between upper and lower base papers

and optionally further in view of:

Soviet Union's suggestion to improve stability of foam and improve strength of lightweight concrete or plaster board by using a **"mixture for pore formation"** ("**pregenerated foam**") obtained by mixing ferric sulfate *and* alkyl-aromatic sulphonate(s),

Japan's suggestion to obtain lightweight plaster board having adhesive property to paper and improved strength by using a "foam adjusting agent" for controlling

size of air cells in gypsum slurry such as fatty acid derivative, ferric sulfate, aluminum sulfate, etc. and a frothing agent such as alkyl ether sulfate, or  
Great Britain's suggestion to form a **"prefoam"** (**"pregenerated foam"**) for  
lightweight foamed cement by mixing sulphosuccinate and alkyl sulfate or alkyl ether sulfate.

Hence, the admitted prior art substantially discloses the claimed invention (including the rough cutting step) except for the use of two agents to form the pregenerated foam.

Sucech motivates one of ordinary skill in the art to use two agents to form pregenerated foam to obtain the benefit of controlling void size (and thereby improve nail pull and strength) in a foamed gypsum board. The claimed "stock solution of the foaming agent" reads on one agent of Sucech and the claimed "pore size adjusting agent" reads on the other agent of Sucech since the combination of these agents function to create voids of desired size. For example, the claimed "stock solution of foaming agent" reads on Sucech's first stable foaming agent such as alkyl ether sulfate (major portion with  $y \geq 1$ ).

It is noted that alkyl ether sulfate is used as the foaming agent in applicant's example.

The claimed "pore size adjusting agent" reads on the second foaming agent such as alkyl sulfate since Sucech explains that increasing the amount of alkyl sulfate ( $y = 0$ ) increases the size of the bubbles. The combination of the admitted prior art and Sucech is considered to constitute a prima facie case of obviousness. In any event, it is clear that the admitted prior art and Sucech teach a "stock solution of foaming agent". The optional secondary art to Soviet Union, Japan or Great Britain suggest using a compound falling within the scope of "pore size adjusting agent" in combination with a

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"foaming agent". The claimed "pore size adjusting agent" reads on ferric sulfate as disclosed by Soviet Union, the foam adjusting agent (e.g. ferric sulfate or aluminum sulfate) suggested by Japan or sulphosuccinate as suggested by Great Britain.

With respect to amount, the claimed amount of 0.00001 to 0.005 parts by weight pore adjusting agent would have been obvious in view of the amount of "pore adjusting sizing agent" suggested by Sucech, Soviet Union, Japan or Great Britain. With respect to Sucech, Soviet Union and Great Britain, it is taken as well known / conventional per se in the gypsum board art to use a small amount such as 0.01 - 0.03 parts by weight of foaming agent comprising alkyl ether sulfate per 100 parts gypsum. With respect to Japan, it is noted that Japan teaches using a quantity of 0.001 to 0.01 parts by weight per 100 parts by weight calcined gypsum.

As to claim 3 ( water-soluble acidic substances, strong acids) and claim 4 (aluminum sulfate, ferric sulfate), note Soviet Union's teaching to use ferric sulfate or Japan's teaching to use foam adjusting agent such as ferric sulfate or aluminum sulfate. It is emphasized that Sucech and Japan disclose using alkyl ether sulfate as a foaming agent and that Japan teaches using foam adjusting agent such as ferric sulfate or aluminum sulfate in combination with alkyl ether sulfate.

As to claim 5 (sulphosuccinate-type surface active agents), note Great Britain's suggestion to use sulphosuccinate. It is emphasized that Sucech and Great Britain disclose using alkyl ether sulfate as foaming agent and that Great Britain suggests using sulphosuccinate in combination with alkyl ether sulfate.

Remarks

3) Applicant's arguments filed 12-18-07 have been fully considered but they are not persuasive.

Applicant argues that the combination of steps of blowing air into a blended stream of the first and second foaming agents to produce foams and mixing the foams into the gypsum slurry is not disclosed or suggested in Sucech. This argument is not persuasive. The admitted prior art discloses the combination of steps of blowing air into a foaming agent to produce "foam" and then mixing the "foam" into kneaded material that contains calcined gypsum, adhesive, various additives and water. See page 1 lines 19-33 and page 2 lines 1-12 of the specification. Examiner acknowledges that the admitted prior art is silent as to the composition of the foaming agent. However, Sucech is not silent as to the composition of a foaming agent. In particular, Sucech et al discloses a composition comprising a mixture of first foaming agent (for producing small foam voids) and second foaming agent (for forming larger size voids). Sucech et al is also not silent as to the use of air with the mixture (blended stream) of the first and second foaming agents. Attention is directed to Sucech's teaching to (1) mix the two foaming agents just prior to feeding them into the foam generator (col. 3 lines 17-18) and (2) Sucech et al's teaching that foam is generated from a mixture of liquid foaming agent, air and water in a suitable foam generating apparatus (col. 1 lines 18-20). Thus, the admitted prior art and Sucech et al when considered as a whole teach the claimed preliminarily adding step, blowing air step and mixing into kneaded material step.

Applicant argues that the amount of 0.00001 parts through 0.005 parts by weight per 100 parts by weight calcined gypsum is not disclosed by Sucech. This argument is not persuasive. Sucech et al discloses an example using a foam weight of 7 lb/cuft and a stucco weight of 1225 lb/MSF. Sucech et al also teaches blending the first foaming agent and second foaming agent in a ratio generally less than 50/50. The claimed amount of "pore adjusting agent" (either the first foaming agent or the second foaming agent) being 0.00001 parts through 0.005 parts by weight per 100 parts by weight calcined gypsum would have been obvious in view of the amount of "pore adjusting agent" suggested by Sucech et al. This is especially true since Sucech et al teaches using alkyl ether sulfate for the first foaming agent and, as asserted in the last office action, "it is taken as well known / conventional per se in the gypsum board art to use a small amount such as 0.01 - 0.03 parts by weight of foaming agent comprising alkyl ether sulfate per 100 parts gypsum.

It is noted that applicant fails to argue that the claimed pore adjusting agent does not read on (1) one of the foaming agents disclosed by Sucech et al, (2) ferric sulfate as disclosed by Soviet Union, (3) "foam adjusting agent" for controlling size of air cells in gypsum slurry such as fatty acid derivative, ferric sulfate, aluminum sulfate, etc. as disclosed by Japan, or (4) sulphosuccinate and alkyl sulfate or alkyl ether sulfate as disclosed by Great Britain. With respect to amounts disclosed by the latter three references, the range of 0.001 to 0.01 disclosed by Japan overlaps the claimed range and the optimum amount of ferric sulfate (Soviet Union) or sulphosuccinate (Great Britain) could have been determined without undue experimentation.



Applicant argues that the foam adjusting agent in Japan is added directly to the slurry. More properly, Sucech teaches mixing the first foaming agent and second foaming agent to form a mixture and then combining this mixture with air in a foam generating apparatus to form a foam and then adding the foam to the slurry.

4) No claim is allowed.

5) **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

6) Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven D. Maki whose telephone number is (571) 272-1221. The examiner can normally be reached on Mon. - Fri. 8:30 AM - 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Steven D. Maki/  
Primary Examiner, Art Unit 1791

Steven D. Maki  
March 16, 2008